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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/914,212 | 08/23/2001 | Gordon Lee Ellis | P 0282782 | 1779 |

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| EXAMINER | |
|---|---|
| SHOSHO, CALLIE E | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1714 | |

DATE MAILED: 11/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/914,212 | ELLIS ET AL. | |
| | Examiner | Art Unit | |
| | Callie E. Shosho | 1714 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *22 July 2003 and 12 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *21-27,29,30,33-36 and 38-53* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *40-53* is/are allowed.

6)☒ Claim(s) *21-24,26,27,29,30,33-36,38 and 39* is/are rejected.

7)☐ Claim(s) *25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

1. All outstanding rejections are overcome by applicants' amendments filed 7/22/03 and 9/12/03.

The following office action is non-final in light of the new grounds of rejection as set forth below which includes the use of a new reference against the present claims, namely, Johnson et al. (U.S. 5,803,959).

### *Claim Rejections - 35 USC § 103*

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 21-24, 26, 30, 33-36, and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anton et al. (U.S. 6,005,023) in view of Johnson et al. (U.S. 5,803,959).

Anton et al. disclose ink jet ink comprising 0.1-25% graft copolymer which has weight average molecular weight of 5,000-100,000 and comprises 50-90% hydrophobic polymeric backbone and 10-50% hydrophilic macromer sidechain made from monomers such as (meth)acrylic acid which has weight average molecular weight of 1,000-30,000, 70-99.8% water, and 0.1-8% pigment such as carbon black. The ink has viscosity of 1-10 cP and is filtered through 1 micron filter. It is noted that the hydrophobic polymer is obtained from monomers such as methyl methacrylate which possesses glass transition temperature of 105 $^{0}$C. There is also disclosed process for printing the above ink as well as ink jet printer which comprises the

above ink (col.2, lines 10-32 and 60-67, col.3, lines 13-47, col.4, lines 27-28, col.5, lines 44-46, col.7, lines 24-34, col.10, lines 44-47, and col.12, lines 17-19).

It is noted that while Anton et al. disclose weight average molecular weight of the graft copolymer and hydrophilic polymer (sidechain), there is no disclosure of the weight average molecular weight of the hydrophobic polymer (backbone). However, given that the graft copolymer which comprises hydrophobic polymer and hydrophilic polymer has weight average molecular weight of 5,000-100,000 and the hydrophilic polymer alone has weight average molecular weight of 1,000-30,000, it is clear that the weight average molecular weight of the hydrophobic polymer must range from 4,000-70,000.

Further, it is noted that Anton et al. disclose weight average molecular weight not number average molecular weight as presently claimed. However, given the relationship between weight average molecular weight ($M_w$) and number average molecular weight ($M_n$), i.e. $M_w/M_n \geq 1$, it is clear that number average molecular weight for the hydrophilic polymer and hydrophobic polymer will overlap the number average molecular weight presently claimed.

The difference between Anton et al. and the present claimed invention is the requirement in the claim that (a) the carbon black carries ionic groups and (b) the hydrophilic polymer and hydrophobic polymer are prepared separately.

With respect to difference (a), Johnson et al. disclose the use of carbon black having attached ionic groups in order to provide improved jetness, blue tone, and gloss. Johnson et al. also disclose that such carbon blacks are suitable for use in ink jet inks (col.2, lines 51-56 and 60-64 and col.7, lines 15-17).

In light of the motivation for using carbon black which carries ionic groups disclosed by Johnson et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such carbon black in the ink of Anton et al. in order to produce ink improved jetness, blue tone, and gloss, and thereby arrive at the claimed invention.

With respect to difference (b), Anton et al. disclose polymerizing the hydrophobic polymer in the presence of the hydrophilic polymer while present claim 34 requires preparing the polymer separately. However, "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself". See MPEP 2113.

Thus, although Anton et al. do not disclose preparing the hydrophilic polymer and hydrophobic polymer separately, it is noted that "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process", In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) . Further, "although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product", In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir.1983).

Therefore, absent evidence of criticality regarding preparing the hydrophilic polymer and hydrophobic polymer and given that the cited references meet the requirements of the claimed

composition, i.e. ink comprising both hydrophilic polymer and hydrophobic polymer, it is clear that Anton et al. meet the requirements of present claim 34.

4. Claims 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Anton et al. in view of Johnson et al. as applied to claims 21-24, 26, 30, 33-36, and 38-39 above, and further in view of Shioya et al. (U.S. 4,732,613).

The difference between Anton et al. in view of Johnson et al. and the present claimed invention is the requirement in the claims regarding the amount of divalent and multivalent metal ions present.

Shioya et al., which is drawn to ink jet ink, disclose that the presence of divalent and higher valent metal ions are most responsible for clogging of printer nozzles, formation of precipitates during storage of inks, and deposition of foreign matter on printer heating heads. In order to avoid these problems, Shioya et al. disclose removing metal ions from the ink by ion exchange, filtration, etc. in order to produce ink with less than 20 ppm divalent or higher valent metal ions (col.1, lines 57-61, col.2, lines 15-28, and col.4, lines 59-68).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to control the level of the divalent and multivalent metal ions present in the ink of Anton et al. to amount less than 20 ppm in order to produce an ink which has good storage stability, produces no clogging, and does not form deposits on the printer head, and thereby arrive at the claimed invention.

***Allowable Subject Matter***

5. Claims 40-53 are allowable over the "closest" prior art Anton et al. (U.S. 6,005,023) and Johnson et al. (U.S. 5,803,959) given that there is no disclosure or suggestion in either reference of ink comprising hydrophilic polyurethane and hydrophobic polymer as required in present claims 40-53.

6. Claim 25 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 25 would be allowable if rewritten in independent form as described above given that there is no disclosure or suggestion in the "closest" prior art, namely, Anton et al. (U.S. 6,005,023) and Johnson et al. (U.S. 5,803,959), of ink comprising hydrophobic acrylic polymer and hydrophobic polyurethane as required in claim 25.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 703-305-0208. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 703-306-2777. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
11/24/03